REMARKS/ARGUMENTS

Applicant respectfully requests further examination and reconsideration in view of the instant response. Claims 1-27 remain pending in the present case. Claims 1-27 are rejected.

CLAIM REJECTIONS

35 U.S.C. §102(e)

Claims 1 and 23

Claims 1 and 23 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,564,162 by Erskine (referred to hereinafter as "Erskine") Applicant has reviewed Erskine and respectfully submit that the claimed embodiments as recited in Claims 1 and 23 are not anticipated by Erskine for at least the following rationale.

According to MPEP 2131, "to anticipate a claim, the reference must teach every element of the claim." Further, as cited in MPEP 2131, "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Additionally, according to MPEP 2131, "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicant respectfully directs the Examiner to independent Claim 1 that recites that an embodiment of the present invention is directed to (emphasis added):

A method for testing floating point hardware in a processor while executing a computer program, comprising:

executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result;

executing said first floating point instruction utilizing said floating point hardware, thereby obtaining a hardware-generated result; and

comparing said emulated result with said hardware-generated result.

Claim 23 contains similar recitations as Claim 1.

Applicant respectfully submits that Erskine is different from the claimed embodiments. Applicants understand Erskine to teach "running a code sequence on the device at a first operating point to generate predicted results and then running the same code sequence on the device at a second operating point defined by changing an electrical parameter of the first operating point to generate actual results," [Abstract]. In particular, Applicant respectfully submits that Erskine does not teach, describe or suggest "executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result" (emphasis added) as claimed. But rather Erskine teaches, "[s]oftware algorithms and, optionally, software emulation are used to initially construct a code sequence having specific probabilities of various instruction types, various data types, etc. The code sequence may be any desired length, such as 20-100 lines of code, for instance. The code sequence will further have an initial context when created that is reflective of values contained within general registers, floating point registers, and cache memory of the device," (emphasis added) [Col 3, lines 40-48]. Erskine further teaches, "predicted results for the initial code sequence, i.e. before permutations or changes have occurred to the code sequence, are generated by either running the initial code sequence on the device at a

first operating point of the device or by performing software emulation on the initial code sequence," [Col 3, lines 52-57]. Thus, Erskine teaches using either running a code sequence on the device or by performing a software emulation on the initial code sequence, wherein the initial code sequence is reflective of values contained within floating point registers, thereby Erskine teaches running code using floating point hardware, either via the code sequence or actual hardware, therefore Erskine does not teach, "executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result" (emphasis added) as claimed.

Applicant respectfully asserts that Erskine does not teach, disclose or suggest the claimed embodiments of the present invention as recited in independent Claim 1, that this claim overcomes the rejection under 35 U.S.C. § 102(e), and that this claim is thus in a condition for allowance. Additionally, Applicant respectfully asserts that Erskine does not teach, disclose or suggest the claimed embodiments of the present invention as recited in independent Claim 23, that this claim overcomes the rejection under 35 U.S.C. § 102(e), and that this claim is thus in a condition for allowance

35 U.S.C. Section 103(a) Rejections

Claims 2, 4-7, 9-14, 16-19, 21, 22, and 24-27

Claims 2, 4-7, 9-14, 16-19, 21, 22, 24-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Erskine in view of U.S. Patent No. 6564,162 by Van Dyke (referred to hereinafter as "Van Dyke"). Claims are 1, 13 and 23 are independent claims. Claims 2, 4-7, 9-14, 16-19, 21, 22, 24-27 are dependent on independent Claims 1, 13 and 23, and includes the

recitations of independent Claims 1, 13 and 23. Hence, by demonstrating that Erskine and Van Dyke do not show or suggest the limitations of Claims 1, 13 and 23, it is also demonstrated that Erskine and Van Dyke do not show or suggest the embodiments of Claims 2, 4-7, 9-14, 16-19, 21, 22, 24-27.

"As reiterated by the Supreme Court in *KSR*, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries" including "[a]scertaining the differences between the claimed invention and the prior art" (MPEP 2141(II)). "In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious" (emphasis in original; MPEP 2141.02(I)). Applicant notes that "[t]he prior art reference (or references when combined) need not teach or suggest all the claim limitations, however, Office personnel must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art" (emphasis added; MPEP 2141(III)).

Applicant respectfully submits that the claimed embodiments as a whole overcome the rejections under 35 U.S.C. §103(a), as the claims are neither taught nor suggested by Erskine and Van Dyke, and that Office personnel have not explained why differences would have been obvious. Independent Claim 13 recites (emphasis added),

> A method for detecting failure in floating point hardware of a processor while executing a computer program, comprising:
> entering a diagnostic mode, including

executing a first floating point operation of said computer program by emulating said floating point operation with a set of non-floating point operations, thereby obtaining an emulated result,

executing said first floating point operation utilizing said floating point hardware, thereby obtaining a hardware-generated result, and

comparing said emulated result with said hardware-generated result to detect said failure to detect said failure;

determining whether diagnostic mode is to be continued; and

resuming execution of said computer program in a non-diagnostic mode if said diagnostic mode is to be discontinued, said non-diagnostic mode involving performing floating point operations of said computer program without emulating with non-floating point operations.

Applicant respectfully submits that Erskine does not teach or suggest, among other things, "executing a first floating point operation of said computer program by emulating said floating point operation with a set of non-floating point operations, thereby obtaining an emulated result," (emphasis added) as recited by Claim 13. Applicant understands Erskine to disclose, "running a code sequence on the device at a first operating point to generate predicted results and then running the same code sequence on the device at a second operating point defined by changing an electrical parameter of the first operating point to generate actual results," [Abstract]. Specifically, Applicant understands Erskine to disclose, "[s]oftware algorithms and, optionally, software emulation are used to initially construct a code sequence having specific probabilities of various instruction types, various data types, etc. The code sequence may be any desired length, such as 20-100 lines of code, for instance. The code sequence will further have an initial context when created that is reflective of values contained within general registers, floating point registers, and cache memory of the device," (emphasis added) [Col 3, lines 40-48]. Thus, Erskine teaches using either running a code sequence on the device or by performing a software emulation on the initial code sequence, wherein the initial

code sequence is reflective of values contained within floating point registers, thereby Erskine teaches running code using floating point operations to access floating point registers, either via the code sequence or actual hardware, therefore Erskine does not teach, "executing a first floating point operation of said computer program by emulating said floating point operation with a set of non-floating point operations, thereby obtaining an emulated result" (emphasis added) as claimed.

Furthermore, Applicant respectfully submits that Van Dyke does not overcome the shortcomings of Erskine. The Applicant understands the Van Dyke to teach a "computer has a general register file of registers, a RISC instruction decoder, and a CISC instruction decoder," [Abstract]. More specifically, Van Dyke teaches, "[i]n one example, the X86 definition requires that the destination register of a floating- point operation be left unmodified in certain cases of IEEE-754 non-numeric data," [Col. 132, lines 45-47]. Applicant respectfully submits that Van Dyke does not teach "executing a first floating point operation of said computer program by emulating said floating point operation with a set of non-floating point operations, thereby obtaining an emulated result" (emphasis added) as claimed, but rather Van Dyke gives an example of an unmodified destination register of a floating-point operation, thereby not disclosing emulating floating point operations with non-floating point operations. In addition, Applicant respectfully submits that Van Dyke does not teach "executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result," as cited by Claims 1 and 23, as Applicant understands Van Dyke to be silent regarding executing code without using

floating point hardware. As such, Applicant respectfully submits that Van Dyke does not overcome the shortcomings of Erskine.

Therefore, for at least the reasons cited above, Applicant respectfully submits that Erskine and Van Dyke do not teach each and every claim limitation of the Claims 1, 13 and 23 (as discussed above), and as Office personnel have not explained why difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art, and as such, Claim 13 overcomes the rejection under 35 U.S.C. §103(a) and is in condition for allowance.

Accordingly, the Applicant also respectfully submits that Erskine and Van Dyke do not teach each and every claim limitation of the Claims 2, 4-7, 9-12, 14, 16-19, 21, 22, 24-27, dependent on Claims 1, 13 and 23, for reasons that its independent claim should be patentable. As such, Applicant respectfully submits that Claims 2, 4-7, 9-12, 14, 16-19, 21, 22, 24-27 overcome the rejection under 35 U.S.C. §103(a) and are allowable as pending from allowable base Claims and reciting additional features.

35 U.S.C. Section 103(a) Rejections

Claims 3 and 8

Claims 3 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Erskine in view of U.S. PGPUB 20040158600 by Markstein et al. (referred to hereinafter as "Markstein"). Claims 3 and 8 are dependent on independent Claim 1, and includes the recitations of independent Claim 1. Hence, by demonstrating that Erskine and Markstein do not

show or suggest the limitations of Claim 1, it is also demonstrated that Erskine and Markstein do not show or suggest the embodiments of Claims 3 and 8.

As discussed above, Applicant respectfully submits that Erskine does not teach each and or suggest, among other things, "executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result," as cited.

Furthermore, Applicant respectfully submits that Markstein does not overcome the shortcomings of Erskine. The Applicant understands the Markstein to teach a "method and system is used to determine the correct rounding of a floating point function," [Abstract]. More specifically, Markstein teaches, "the method involves executing a machine instruction to indicate whether the floating point computation may contain a rounding error," [Paragraph 6]. Applicant respectfully submits that Markstein does not teach "executing a first set of code of said computer program without employing said floating point hardware, said first set of code having a first floating point instruction, thereby obtaining an emulated result" (emphasis added) as claimed, but rather Markstein teaches a method for determining computation rounding errors. As such, Applicant respectfully submits that Markstein does not overcome the shortcomings of Erskine.

Therefore, for at least the reasons cited above, Applicant respectfully submits that Erskine and Markstein do not teach each and every claim limitation of Claim 1 (as discussed above), and as Office personnel have not explained why difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art, and as such,

Applicant respectfully submits that Claims 3 and 8 overcome the rejection under 35 U.S.C. §103(a) and are allowable as pending from an allowable base Claim and reciting additional features.

35 U.S.C. Section 103(a) Rejections

Claims 15 and 20

Claims 15 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Erskine in view of Van Dyke and further in view of Markstein. Claims 15 and 20 are dependent on independent Claim 13, and includes the recitations of independent Claim 13. Hence, by demonstrating that Erskine, Van Dyke, and Markstein do not show or suggest the limitations of Claim 13, it is also demonstrated that Erskine, Van Dyke, and Markstein do not show or suggest the embodiments of Claims 15 and 20.

As discussed above, Applicant respectfully submits that Erskine and Van Dyke do not teach each and or suggest, among other things, "executing a first floating point operation of said computer program by emulating said floating point operation with a set of non-floating point operations, thereby obtaining an emulated result," as cited.

Furthermore, Applicant respectfully submits that Markstein does not overcome the shortcomings of Erskine and Van Dyke. The Applicant understands the Markstein to teach a "method and system is used to determine the correct rounding of a floating point function," [Abstract], and as similarly discussed above, Markstein does not teach "executing a first floating point operation of said computer program by emulating said floating point operation with a set of

non-floating point operations, thereby obtaining an emulated result," (emphasis added) as claimed, but rather Markstein teaches a method for determining computation rounding errors. As such, Applicant respectfully submits that Markstein does not overcome the shortcomings of Erskine and Van Dyke.

Therefore, for at least the reasons cited above, Applicant respectfully submits that Erskine, Van Dyke, and Markstein do not teach each and every claim limitation of the Claim 13 (as discussed above), and as Office personnel have not explained why difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art, and as such, Claims 15 and 20 overcome the rejection under 35 U.S.C. §103(a) and are allowable as pending from an allowable base Claim and reciting additional features.

CONCLUSION

In light of the above remarks, Applicant respectfully requests allowance of Claims 1-27.

The Examiner is invited to contact Applicant's undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,

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